



General Certificate of Secondary Education

Chemistry 4421

CHY3F Unit Chemistry 3

Report on the Examination

2010 Examination – June series

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Chemistry
Foundation Tier CHY3F**General**

The standard of responses was a lot higher than last year in all respects. The vast majority of scripts were also concise and very legible.

The mark scheme was flexible enough to allow candidates to express their answers in a variety of ways and still gain marks.

However, nearly three quarters of the candidates gained no marks on question 1(c), ionisation of strong acids and strong alkalis and question 5(d), one way of removing ions that cause hardness. The following questions proved particularly difficult for over half of the candidates: question 1(b), using Universal Indicator to show the difference between a strong and a weak acid; question 5(b), why the water from Crete is harder than the other two; question 5(c), why people using hard water can expect higher costs.

Many of the questions that were less well answered tended to be those that involved recalling specific knowledge, and those that required explanation and the use of specific scientific terms. Candidates do need to make the effort to learn the factual material given in the Specification.

Questions 5 and 6 were standard demand questions and were common with questions 1 and 2 on the Chemistry Unit 3 Higher Tier Paper (CHY3H).

This report should be read in conjunction with the published mark scheme.

Question 1 (Low demand)

- (a) There were no major problems with this part.
- (b) Almost half of the students gained no marks. Many candidates gave the answer in terms of carrying out a titration and adding methyl orange while others gave vague answers such as there will be a colour change.
- (c) A large majority of the candidates were unable to recognize the fact that strong acids and strong alkalis are completely ionized in water.
- (d) The majority of the candidates were able to gain marks for all the parts.
- (d) (iii) Some candidates wrote add a few drops at a time while others suggested making the equipment more accurate.

Question 2 (Low demand)

Both parts of the question were quite well attempted

Question 3 (Low demand)

On the whole, this question was quite well attempted.

Parts (a)(iii) and (a)(iv) proved difficult for a few candidates, who were unable to identify a halogen and the element with atomic number of 7.

Question 4 (Low demand)

- (a) (i) A few candidates could not recall the test for Fe^{2+} ions but the vast majority managed to gain at least one mark here.
- (a) (ii) This was better attempted and a large number of candidates managed to gain at least two marks.
- (b) Some candidates found this difficult. There were vague answers like heat the compound with a Bunsen burner or place it in a beaker and heat it. Others suggested carrying out a test for either hydrogen or oxygen gas, eg put the compound in a test tube, bring a lighted splint near the mouth of the test tube and see if there is a pop sound.
- (c) Some candidates gave the names of instrumental methods eg mass spectrometry. Others gave vague answers such as it will be fairer or there will not be much wastage of the sample while some candidates made references to cost and safety.

Question 5 (Standard demand)

This question proved quite difficult for many of the candidates.

- (a) Nearly half of the candidates gained no marks here. The first marking point was rocks. A large number of candidates wrote water treatment processes, acid rain, fertilizers and walls of the wells. They missed out on the second mark as the common answers given were mixed, absorbed, picks up or gets into.
- (b) A large number of candidates lost this mark as they negated the correct answer by mentioning other ions such as chloride. Some candidates just wrote overall it has more ions.
- (c) This was also quite poorly attempted. There were vague answers like it costs more as it is expensive to produce or hard water is healthy, therefore the companies that sell it raise its price.
- (d) Almost three quarters of the candidates found this difficult. Answers included use washing powder, use sodium, ionisation, electrolysis, titration and chlorination.

Question 6 (Standard demand)

- (a) (i) Some candidates drew a curve while others produced multiple lines.
- (a) (ii) The majority of the candidates were able to read off the correct value from the graph. However, there were some candidates who got the scale wrong, 5500 was read as 5050.
- (a) (iii) A lot of candidates gave quite vague answers here, eg because you follow the line up and across, because of the line of best fit and it fits the pattern.
- (a) (iv) A large number of candidates read off the value for butane as 2850, multiplied by 2, got the answer as 5700 and then went back to part (ii) and changed their answer to 5700 so that they could say yes, the student's prediction is correct. In doing so, many of them lost the mark in part (ii) as 5700 did not correspond to

the value from their graph. Candidates need to know that the answer does not always have to be yes.

Some candidates just showed the working and lost the second mark while others showed no working and just wrote yes or no.

Here again, there were some candidates who got the scale wrong and misread the value for butane.

- (b) (i) Some candidates misinterpreted the question. They added the values for coal and natural gas to get 87, then added the values for hydrogen and bio-ethanol to get 171 and came up with yes as their answer.
- (b) (ii) Some candidates answered the question in terms of the number of products formed by each fuel while others wrote in terms of the amount of heat released by each fuel. A few candidates wrote sulfur instead of sulfur dioxide while a small number of candidates wrote that non-renewable fuels will run out.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the [Results statistics](#) page of the AQA Website.